UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,458	08/20/2003	Preston F. Crow	EMC-99-026CON1	5940

24227 7590 10/13/2006

EMC CORPORATION
OFFICE OF THE GENERAL COUNSEL
176 SOUTH STREET
HOPKINTON, MA 01748

EXAMINER	
LY, ANH	

ART UNIT	PAPER NUMBER
2162	

DATE MAILED: 10/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/644,458	CROW ET AL.	
	Examiner	Art Unit	
	Anh Ly	2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) *3,7-12 and 15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-6,13,14 and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *10/03/2006* .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action is response to applicants' RESPONSE filed on 07/18/2006.

2. Claims 1-2, 4-6, 13-14 and 16 are pending in this Application.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-2, 4-6, 13-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Background of the invention of this Application Specification and Fig. 1 (hereinafter as Background and Fig. 1) in view of Pub. No.: US 2004/0133570 A1 of Soltis.

With respect to claim 1, Background and Fig. 1 teaches a memory storage device having an operating system which uses at least one inode for accessing file segments (UNIX Operating System, an computer system storing a sequence of file segments and each file segment occupies a consecutive sequence of physical storage blocks and I-nodes: see Fig.1 (Prior Art)), the inode comprising:

a plurality of rows (Fig.1, I-node 1 and I-node 2, each has a plurality of rows or extents); and

a portion of the rows storing extents pointing to data blocks (the storage addresses of the segments by an address pointer and a length. The address pointer indicates the physical address of the data block (see blocks 55-58, and block 97).

Background and Fig. 1 teaches a file system that UNIX operating systems employs to translate between abstract file names and physical storage addresses. The consecutive extents of each I-node correspond to consecutive file segments and indicate the storage addresses of the segments by an address pointer and a length. And each I-node comprises a plurality of rows or extents. Background and Fig. 1 does not clearly teach each extent having a field to indicate whether the extent is an indirect extent, a hole extent or a direct extent.

However, Soltis teaches each extent may address several consecutive device data blocks and each extent includes a flag or a filed to indicate the type of that extent (sections 0079-0083).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Background and Fig. 1

with the teachings of Soltis. One having ordinary skill in the art would have found it motivated to utilize the use of the field or flag indicating the type of extent for each extent extents as disclosed (Soltis' section 0079), into the system of Background and Fig. 1 for maximize storage efficiency of a memory storage system device, thereby, providing a file system for network data servers that is specifically designed to efficiently and reliably control the storage and access of remote files on remote secondary storage system, and can provide for the flexibility to support future developments that will increase the speed and usage of distributed computer network environment (Soltis's sections 0005-0007 and 0021-0023).

With respect to claims 2 and 4, Background and Fig. 1 teaches a memory storage device having an operating system as discussed in claim 1.

Background and Fig. 1 teaches a file system that UNIX operating systems employs to translate between abstract file names and physical storage addresses. The consecutive extents of each I-node correspond to consecutive file segments and indicate the storage addresses of the segments by an address pointer and a length. And each I-node comprises a plurality of rows or extents. Background and Fig. 1 does not clearly teach wherein each I-node is adapted to allow any portion of extents sorted therein to be indirect extents and the number of data blocks pointed to indirect extent.

However, Soltis teaches direct and indirect extents and data blocks (indirect extent pointer: sections 0126-0127 and see page 11, claim 50 and section 0010).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Background and Fig. 1

with the teachings of Soltis. One having ordinary skill in the art would have found it motivated to utilize the use of the field or flag indicating the type of extent for each extent extents as disclosed (Soltis' section 0079), into the system of Background and Fig. 1 for maximize storage efficiency of a memory storage system device, thereby, providing a file system for network data servers that is specifically designed to efficiently and reliably control the storage and access of remote files on remote secondary storage system, and can provide for the flexibility to support future developments that will increase the speed and usage of distributed computer network environment (Soltis's sections 0005-0007 and 0021-0023).

With respect to claim 5, Background and Fig. 1 teaches an automated method of storing data files in a memory storage system (UNIX Operating System, an computer system storing a sequence of file segments and each file segment occupies a consecutive sequence of physical storage blocks and I-nodes: see Fig.1 (Prior Art)), the inode comprising:

assigning an I-node to a data file to be stored and writing a plurality of extents in the I-node, each extent pointing to a string of one or more data blocks for storing a segment of the data file (Fig.1, I-node 1 and I-node 2, each has a plurality of rows or extents; and the storage addresses of the segments by an address pointer and a length. The address pointer indicates the physical address of the data block (see blocks 55-58, and block 97).

Background and Fig. 1 teaches a file system that UNIX operating systems employs to translate between abstract file names and physical storage addresses. The

consecutive extents of each I-node correspond to consecutive file segments and indicate the storage addresses of the segments by an address pointer and a length. And each I-node comprises a plurality of rows or extents. Background and Fig. 1 does not clearly teach each extent having a field to indicate whether the extent is an indirect extent, a hole extent or a direct extent.

However, Soltis teaches each extent may address several consecutive device data blocks and each extent includes a flag or a filed to indicate the type of that extent (sections 0079-0083).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Background and Fig. 1 with the teachings of Soltis. One having ordinary skill in the art would have found it motivated to utilize the use of the field or flag indicating the type of extent for each extent extents as disclosed (Soltis' section 0079), into the system of Background and Fig. 1 for maximize storage efficiency of a memory storage system device, thereby, providing a file system for network data servers that is specifically designed to efficiently and reliably control the storage and access of remote files on remote secondary storage system, and can provide for the flexibility to support future developments that will increase the speed and usage of distributed computer network environment (Soltis's sections 0005-0007 and 0021-0023).

With respect to claim 6, Background and Fig. 1 teaches a memory storage device having an operating system as discussed in claim 1.

Background and Fig. 1 teaches a file system that UNIX operating systems employs to translate between abstract file names and physical storage addresses. The consecutive extents of each I-node correspond to consecutive file segments and indicate the storage addresses of the segments by an address pointer and a length. And each I-node comprises a plurality of rows or extents. Background and Fig. 1 does not clearly teach replacing each of a plurality of the direct extents by at least one indirect extent pointing to a data block and writing to each data block pointed to by one the indirect extents the direct extent that is replaced by the one indirect extents.

However, Soltis teaches direct and indirect extents and data blocks (indirect extent pointer: sections 0126-0127 and see page 11, claim 50 and section 0010).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Background and Fig. 1 with the teachings of Soltis. One having ordinary skill in the art would have found it motivated to utilize the use of the field or flag indicating the type of extent for each extent extents as disclosed (Soltis' section 0079), into the system of Background and Fig. 1 for maximize storage efficiency of a memory storage system device, thereby, providing a file system for network data servers that is specifically designed to efficiently and reliably control the storage and access of remote files on remote secondary storage system, and can provide for the flexibility to support future developments that will increase the speed and usage of distributed computer network environment (Soltis's sections 0005-0007 and 0021-0023).

With respect to claim 13, Background and Fig. 1 teaches a plurality of data storage device, each operating system including an extent based file system for abstracting file names to physical data blocks in the storage device, wherein each extent includes a field to indicate whether the extent points to a block of extents or a block of data (Fig.1, I-node 1 and I-node 2, each has a plurality of rows or extents; and the storage addresses of the segments by an address pointer and a length. The address pointer indicates the physical address of the data block (see blocks 55-58, and block 97).

Background and Fig. 1 teaches a file system that UNIX operating systems employs to translate between abstract file names and physical storage addresses. The consecutive extents of each I-node correspond to consecutive file segments and indicate the storage addresses of the segments by an address pointer and a length. And each I-node comprises a plurality of rows or extents. Background and Fig. 1 does not clearly teach a global cache memory and each extent having a field to indicate whether the extent is an indirect extent, a hole extent or a direct extent.

However, Soltis teaches cache memory (fig. 2 and sections 0007, 0025 and 0063) and each extent may address several consecutive device data blocks and each extent includes a flag or a filed to indicate the type of that extent (sections 0079-0083).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Background and Fig. 1 with the teachings of Soltis. One having ordinary skill in the art would have found it motivated to utilize the use of the field or flag indicating the type of extent for each

extent extents as disclosed (Soltis' section 0079), into the system of Background and Fig. 1 for maximize storage efficiency of a memory storage system device, thereby, providing a file system for network data servers that is specifically designed to efficiently and reliably control the storage and access of remote files on remote secondary storage system, and can provide for the flexibility to support future developments that will increase the speed and usage of distributed computer network environment (Soltis's sections 0005-0007 and 0021-0023).

With respect to claims 14 and 16, Background and Fig. 1 teaches a memory storage device having an operating system as discussed in claim 13.

Background and Fig. 1 teaches a file system that UNIX operating systems employs to translate between abstract file names and physical storage addresses. The consecutive extents of each I-node correspond to consecutive file segments and indicate the storage addresses of the segments by an address pointer and a length. And each I-node comprises a plurality of rows or extents. Background and Fig. 1 does not clearly teach wherein each operating system is adapted to map files to data blocks by assigning an I-node to a file, each I-node capable of storing a plurality of extents and each operating system being a Unix based system.

However, Soltis teaches Unix based operating system and data blocks and a list of extents that address data blocks (sections 0079, 0010, 0095 and 0037).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Background and Fig. 1 with the teachings of Soltis. One having ordinary skill in the art would have found it

motivated to utilize the use of the field or flag indicating the type of extent for each extent extents as disclosed (Soltis' section 0079), into the system of Background and Fig. 1 for maximize storage efficiency of a memory storage system device, thereby, providing a file system for network data servers that is specifically designed to efficiently and reliably control the storage and access of remote files on remote secondary storage system, and can provide for the flexibility to support future developments that will increase the speed and usage of distributed computer network environment (Soltis's sections 0005-0007 and 0021-0023).

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to An Ly whose telephone number is **(571) 272-4039** or via **fax number: (571) 273-4039 (Examiner's fax number)** or e-mail address: **(with your authorization by written statements) anh.ly@uspto.gov.** The examiner can normally be reached on TUESDAY – THURSDAY from 8:30 AM – 3:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene, can be reached on (571) 272-4107 or **Primary Examiner Jean Corrielus (571) 272-4032.**

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see **http://pair-direct.uspto.gov**. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Any response to this action should be mailed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, or faxed to:

Central Fax Center: (571) 273-8300

JEAN M. CORRIELUS
PRIMARY EXAMINER

ANH LY
OCT. 3rd, 2006